

IN THE CLAIMS:

This listing of claims will replace all prior versions, and listings, of claims in the application:

1. (Currently Amended) ~~Integrated optics~~ A coupling element, comprising:
~~characterised in that it comprises in a substrate (11, 21);~~
an optical guide core formed in said substrate (12, 24);; and
an optical cladding (13, 31) formed in said substrate, said optical cladding
being independent of the optical guide core and surrounding at least one portion of the optical
core in a substrate zone called the zone of interaction,
wherein in which a structure defining the cladding has is modulated at least in
the zone of interaction ~~a modulation of its structure~~ so as to form a coupling grating (R)
between the optical guide core and the optical cladding, ~~in which the and~~
wherein a refractive index of the cladding is different from the a refractive
index of the substrate and lower than the a refractive index of the core at least in the a part of
the cladding next to adjacent the optical guide core in the zone of interaction.
2. (Currently Amended) ~~Integrated optics~~ The coupling element of claim 1,
wherein characterised in that a section of said the modulation of the cladding structure is
modulated a modulation of its section.
3. (Currently Amended) ~~Integrated optics~~ The coupling element of claim 1 or 2,
characterised in that wherein a position of said structure with respect to the core is modulated
the modulation of the cladding structure is a modulation of the position of the cladding with
respect to the core.
4. (Currently Amended) ~~Integrated optics~~ The coupling element of any of claims
claim 1 to 3, characterised in that wherein said the modulation of the cladding structure is
obtained modulated by ionic implantation, or ionic exchange or even localised local heating.
5. (Currently Amended) ~~Integrated optics~~ The coupling element of any of claims
claim 1 to 4, characterised in that wherein the said coupling grating formed by the modulation
of the cladding said structure is an apodised apodized grating.

6. (Currently Amended) ~~Integrated optics~~ The coupling element of any of claims claim 2 4 to 5, characterised in that wherein the coupling grating formed by the modulation of the ~~cladding~~ section is a chirped grating.

7. (Currently Amended) A method for fabricating ~~an integrated optics a~~ coupling element ~~in a substrate of claim 1, said coupling element comprising a substrate, an optical guide core, and an optical cladding formed in said substrate, said optical cladding being independent of the optical guide core and surrounding at least one portion of the optical core in a zone of interaction, the method comprising:~~

modifying a refractive index of a substrate to form the optical guide core; and

modifying the refractive index at least in a part of the substrate adjacent the optical guide core and at least in the zone of interaction to form the optical cladding,

wherein ~~characterised in that the cladding and the guide core are respectively created by a modification of the refractive index of the substrate so that at least part of the cladding next to the core and at least in the zone of interaction, the a refractive index of the optical cladding is different from the a refractive index of the substrate and lower than the a refractive index of the optical guide core, and so that~~

wherein the a structure defining the optical cladding in the zone of interaction comprises a modulation of its structure capable of forming is modulated to form a the grating.

8. (Currently Amended) The method of claim 7, ~~characterised in that the modification of wherein~~ the refractive index of the substrate is ~~obtained~~ modulated by radiation and/or by introduction of ionic species.

9. (Currently Amended) The method ~~for fabricating a coupling element according to of~~ claim 8, ~~characterised in that wherein~~ the substrate is ~~selected from~~ includes glass, KTP, LiNbO₃ or ~~even~~ LiTaO₃.

10. (Currently Amended) The method ~~for fabricating a coupling element of claim 8 or 9, characterised in that it comprises the following steps further comprising:~~

a) ~~introduction of a first ionic species in~~ exposing the substrate to a first ionic species ~~so as to permit the optical cladding to be obtained after step c),~~

b) ~~introduction of a second ionic species in exposing the substrate to a second ionic species so as to permit the guide core to be obtained after step c), and~~

c) ~~burying of the ions introduced in steps a) and b) so as~~ said first and said second ionic species to obtain the optical cladding and the optical guide core.

11. (Currently Amended) The method ~~for fabricating a coupling element of claim 10, characterised in that step a) comprises the creation of~~ further comprising:

defining a first mask comprising a pattern ~~capable of obtaining~~ configured to define the cladding, ~~said in which the introduction of the first ionic species is carried out being introduced through this said first mask, and step b) comprises the elimination of the~~
removing said first mask, and

~~the creation of~~ defining a second mask (65) comprising a pattern ~~capable of creating configured to define~~ the optical core, ~~in which the introduction of the said second ionic species is carried out being introduced through this said second mask.~~

12. (Currently Amended) The method ~~for fabricating a coupling element of claim 11, characterised in that wherein the pattern of the first mask is capable of obtaining configured to define the~~ a modulation of the cladding said structure to form the grating.

13. (Currently Amended) The method ~~for fabricating a coupling element of claim 11, characterised in that wherein the pattern of the first mask is uniform, in which the modulation of the cladding and wherein said structure is obtained~~ modulated by localised local heating (63) of the optical cladding.

14. (Currently Amended) The method ~~for fabricating a coupling element of claim 10, characterised in that characterised in that step a) comprises the creation of~~ further comprising:

defining a mask comprising a pattern ~~capable of obtaining~~ configured to define the optical cladding and the optical guide core, ~~the introduction of the first and the second ionic species of steps a) and b) being carried out~~ introduced through this said mask,
and

locally heating in which the modulation of the cladding said structure to modulate said structure ~~is obtained by localised heating.~~

15. (Currently Amended) The method ~~for fabricating a coupling element of claim 11 or 14, characterised in that the masks~~ wherein said first and second mask are made of chrome, alumina or dielectric material.

16. (Currently Amended) The method ~~for fabricating a coupling element of any of claims claim 10 to 15, characterised in that the~~ wherein said burying step comprises a deposit of depositing at least one layer (68) of material with a refractive index lower than that of the cladding, on the surface of the substrate.

17. (Currently Amended) The method ~~for fabricating a coupling element of any of claims claim 10 to 16, characterised in that~~ wherein the burying step is carried out with the application of comprises applying an electrical field to the substrate.

18. (Currently Amended) The method ~~for fabricating a coupling element of any of claims claim 10 to 17, characterised in that~~ wherein the substrate is made of includes glass and ~~contains~~ Na^+ ions, and wherein the first and second ionic species ~~are~~ include Ag^+ and/or K^+ ions.